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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/873,416	06/05/2001	Hidehiko Karasaki	MEIC:107	1853

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EXAMINER

LANDAU, MATTHEW C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 09/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/873,416

Applicant(s)

KARASAKI ET AL.

Examiner

Matthew Landau

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figures 7-12 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3-7, 13, 14, and 20-24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claims 3, 4, 20, and 21, the limitation "harmonic dispensing device" renders the claim indefinite. It is unclear what purpose this component serves.

In regards to claims 5 and 22, it is unclear where the nonlinear optical crystal is disposed. It is unclear what is meant by "an opposite side of said reflector mirror".

In regards to claims 6, 13, and 23, the term "substantially" is a relative term which renders the claim indefinite. The term "substantially" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of

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ordinary skill in the art would not be reasonably apprised of the scope of the invention. The second pause period is rendered indefinite by the use of this term. Furthermore, it is unclear what is meant by the period of the laser pulse train being "extracted" by the width of the laser pulse.

In regards to claims 7, 14, and 24, it is unclear what is meant by the period of the laser pulse train being "extracted" by the width of the laser pulse.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5-9, 18, and 22-26 are rejected under 35 U.S.C. 102(b) as being anticipated by the admitted prior art.

In regards to claim 1, Figure 8 of the instant application discloses a laser device for generating a laser pulse train formed of a sequence of laser pulses, comprising: an output mirror 24; a reflector mirror 21; a gain medium 23 disposed between said output mirror 24 and reflector mirror 21; a Q switch 22 disposed between said output mirror 24 and reflector mirror 21; and a nonlinear optical crystal 26 irradiated with a fundamental wave laser by the laser oscillation.

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The limitation “wherein the laser oscillation is turned on...” is merely a recitation of intended use which does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 5, as best the examiner can ascertain the claimed invention, Figure 8 of the instant application discloses the nonlinear optical crystal 26 is disposed at an opposite side of said reflector mirror 21 about said output mirror 24.

In regards to claim 6, the intended use limitation “wherein the second pause period...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 7, the intended use limitation “wherein the second pause period...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 8, the intended use limitation “wherein a power of the laser pulse...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 9, Figure 8 of the instant application discloses a filter 28.

In regards to claim 18, the admitted prior art discloses a laser processing machine for processing a work, having a laser device for generating a laser pulse train formed of a sequence of laser pulses (see page 2, line 25 of the instant specification). Figure 8 of the instant application discloses a laser device for generating a laser pulse train formed of a sequence of laser pulses, comprising: an output mirror 24; a reflector mirror 21; a gain medium 23 disposed between said output mirror 24 and reflector mirror 21; a Q switch 22 disposed between said output mirror 24 and reflector mirror 21; and a nonlinear optical crystal 26 irradiated with a fundamental wave laser by the laser oscillation. The limitation “wherein the laser oscillation is turned on...” is merely a recitation of intended use which does not structurally distinguish the claimed invention over the admitted prior art.

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In regards to claim 22, as best the examiner can ascertain the claimed invention, Figure 8 of the instant application discloses the nonlinear optical crystal 26 is disposed at an opposite side of said reflector mirror 21 about said output mirror 24.

In regards to claim 23, the intended use limitation “wherein the second pause period...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 24, the intended use limitation “wherein the second pause period...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 25, the intended use limitation “wherein a power of the laser pulse...” does not structurally distinguish the claimed invention over the admitted prior art.

In regards to claim 26, Figure 8 of the instant application discloses a filter 28.

6. Claims 10, 11, 13-15, 28, 29, 31-33, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Johnson et al. (US Pat. 4,930,901, hereinafter Johnson).

In regards to claim 10, Figures 2 and 3(d) of Johnson disclose a method of controlling a laser device having: an output mirror 44; a reflector mirror 42; and a gain medium 38 disposed between said output mirror 44 and reflector mirror 42 for accumulating laser gain, said method comprising the steps of: turning on the laser oscillation during a first pause period before a generation of the laser pulse train; and turning off the laser oscillation during a second pause period before a generation of the laser pulse.

In regards to claim 28, Figures 2 and 3(d) of Johnson disclose a method of processing a work using a laser processing machine including a laser device having: an output mirror 44; a reflector mirror 42; and a gain medium 38 disposed between said output mirror 44 and reflector

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mirror 42 for accumulating laser gain, said method comprising the steps of: turning on the laser oscillation during a first pause period before a generation of the laser pulse train; and turning off the laser oscillation during a second pause period before a generation of the laser pulse.

In regards to claims 11 and 29, Figure 2 of Johnson discloses the step of dispensing only the laser pulse 47.

In regards to claims 13 and 31, as best the examiner can ascertain the claimed invention, Figure 3(d) and 3(e) of Johnson discloses the second pause period is substantially equal to a period of the laser pulse train extracted by a width of the laser pulse.

In regards to claims 14 and 32, as best the examiner can ascertain the claimed invention, Figure 3(d) and 3(e) of Johnson discloses the second pause period is smaller than the period of the laser pulse train extracted by a width of the laser pulse.

In regards to claims 15 and 33, Figures 3(d) and 3(e) Johnson disclose a power of the laser pulse is controlled with the second pause period.

In regards to claim 36, Johnson discloses the work is a printed circuit board (column 5, lines 49-57).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 2 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Yin.

In regards to claims 2 and 19, the difference between the admitted prior art and the claimed invention is the nonlinear optical crystal is disposed between said output mirror and reflector mirror. Figure 1 of Yin discloses a laser device with a nonlinear optical crystal NC disposed between a mirror M1 and a reflector mirror M2. Yin discloses mirror M1 can be an output mirror (column 4, lines 60 and 61). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of the admitted prior art by placing the nonlinear optical crystal between the reflector mirror and the output mirror. The ordinary artisan would have been motivated to modify the admitted prior art in the manner described above for the purpose of decreasing the size of the laser device.

9. Claims 3, 4, 20, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Smart.

In regards to claims 3, 4, 20, and 21, the difference between the admitted prior art and the claimed invention is a harmonic dispensing device (optical modulator) disposed in an output path of the laser pulse. Figure 1 of Smart discloses a laser device with a harmonic dispensing device (optical modulator) 26 disposed in the output path of the laser pulse. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of the admitted prior art by including a harmonic dispensing device (optical modulator) in the output path of the laser pulse. The ordinary artisan would have been motivated

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to modify the admitted prior art in the manner described above for the purpose of preventing at least a portion of secondary laser emission from impinging on a work piece (column 2, lines 30-35).

10. Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of Johnson.

The difference between the admitted prior art and the claimed invention is the work being a printed circuit board. Johnson discloses a laser-processing machine wherein the work is a printed circuit board (see Figure 1 and column 5, lines 49-57). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of the admitted prior art by using a printed circuit board as the work. The ordinary artisan would have been motivated to modify the admitted prior art in the manner described above for the purpose of using a laser to attach leads to circuit contacts (column 1, lines 65-67).

11. Claims 12 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson in view of Smart.

In regards to claims 12 and 30, the difference between Johnson and the claimed invention is the sub step of dispensing only the laser pulse by an optical modulator. Figure 1 of Smart discloses a laser device with an optical modulator 26 disposed in the output path of the laser pulse. In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Johnson by using an optical modulator to dispense the laser pulse. The ordinary artisan would have been motivated to modify Johnson in

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the manner described above for the purpose of preventing at least a portion of secondary laser emission from impinging on a work piece (column 2, lines 30-35).

12. Claims 16, 34, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson in view of Wiechmann et al. (US Pat. 6,009,110, hereinafter Wiechmann).

In regards to claims 16 and 34, the difference between Johnson and the claimed invention is the step of generating harmonic laser from a fundamental wave laser by the laser oscillation. Figure 1 of Wiechmann discloses generating a harmonic laser from a fundamental wave laser by laser oscillation (column 2, lines 53-67). In view of such teaching, it would have been obvious to the ordinary artisan at the time the invention was made to modify the invention of Johnson by including the step of generating a harmonic laser from a fundamental wave laser. The ordinary artisan would have been motivated to modify Johnson in the manner described above for the purpose of generating an output laser with a shorter wavelength.

In regards to claim 35, it is further obvious in the method of Johnson and Weichmann to include the step of separating the harmonic laser and the fundamental wave laser, as disclosed in Weichmann (column 3, lines 15-33), for the purpose of obtaining a single output laser with a specified wavelength.

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Conclusion

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew C. Landau whose telephone number is (703) 305-4396.

The examiner can normally be reached from 8:00 AM-4:30 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



EDDIE LEE
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800

Matthew C. Landau

Examiner

September 25, 2002